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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: SAITO et al. Examiner: Karuna P. Reddy
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Title: ABSORBENT RESIN PARTICLE, AND ABSORBER AND
 ABSORBENT ARTICLE EMPLOYING THE SAME

DECLARATION UNDER 37 C.F.R. 1.132

HON. COMMISSIONER OF PATENTS AND TRADEMARKS
WASHINGTON, D.C. 20231

Dear Sir:

I, Daisuke TAGAWA, a citizen of Japan, residing at 36-1-1109
Hirakawa Chayaura, Jyoyo-shi, Kyoto-fu, Japan, hereby declare as follows:

I am one of the inventors of the invention entitled "ABSORBENT
RESIN PARTICLE, AND ABSORBER AND ABSORBENT ARTICLE
EMPLOYING THE SAME" as claimed in the United States Patent Application
Serial No. 10/566,483 filed on January 30, 2006.

I received a Master's degree from Department of Material Science,
Kyushu Institute of Technology in March 1996. Since April 1996, I have been
working for Sanyo Chemical Industries, Ltd., in Kyoto, Japan, as a researcher
in the field of organic polymers, particularly, absorbent resins. Since October
1996, I have been engaged in researches at the section to which the inventors
also belonged, and have been familiar with the technical field of the present
invention, and I am an inventor of the present invention.

To clarify the differences of the present invention from US Patent No.
4721647 (Nakanishi et al.: Cited Reference 1) and US Patent No. 5002814
(Kanack et al.: Cited Reference 4), I have conducted the following tests.

Tests

1. Regarding Absorbent Articles of Cited Reference 1 (Nakanishi et al.: US
4721647):

Each of absorbent articles of Examples 1 to 5 of the cited reference 1 was subjected to measurement of a diffusion absorption amount, an absorption time (Z), a liquid permeation rate (Y), and a water-retention amount (X) in the manner described below, and the results are shown in Table 1. Disposable diapers in which the absorbent articles of Examples 1 to 5 of the cited reference 1 were used were produced by a method as described below, and each of the disposable diapers was subjected to measurement of an absorption amount until leakage, surface dry feeling, and a SDME surface dryness value. The results are shown in Table 2.

1-1. Preparation of Samples

Samples were prepared by the methods of Examples 1 to 5 of the cited reference 1 (US 4721647), respectively.

1-2. Measurement of Samples

The samples were subjected to measurement according to the methods described in the specification of the present application. However, the absorbent article of the cited reference 1 was in the form such that absorbent resin particles adhere to a base material of fibers, and in this form, it was impossible to weigh a required amount of each sample. Therefore, to enable the measurement, operations were added/changed, as indicated by the underlined parts in the following description so that the amount can be weighed. Besides, since it was impossible to place each sample of the cited reference 1 uniformly in a measurement device, operations were added/changed, as indicated by the underlined parts, for the purpose of placing each sample as uniformly as possible.

1-2-1. Method for Measuring Diffusion Absorption Amount

The method for measuring a diffusion absorption amount used herein was identical to the method described in the specification as filed, except for the underlined parts in the following description of page 48, line 27 to page 49, line 1 of the specification as filed, the underlined parts indicating added/changed contents.

"Measuring method:

In a filtering cylindrical container (2) composed of a cylinder standing vertically (internal diameter: 60 mm, length: 50 mm) and a wire mesh (1) (mesh opening: 150 μ m) at the bottom of the cylinder, 1.25 g of a sample (3),

which has been cut out by scissors so as to have this weight preliminarily is placed so that the sample has as uniform a thickness as possible on the mesh (1)."

1-2-2. Method for Measuring Water-Retention Amount (X)

The method for measuring a water-retention amount (X) used herein was identical to the method described in the specification as filed, except for the underlined parts in the following description of page 52, lines 17 to 21 of the specification as filed, the underlined parts indicating added/changed contents.

"1.00 g of a sample, which has been cut out by scissors so as to have this weight preliminarily, is put in a sack like a teabag made of a 250-mesh nylon net (20 cm in length and 10 cm in width), and it is immersed in 1000 cc of physiological saline (salt concentration: 0.9 wt%) for one hour without stirring."

1-2-3 Method for Measuring Liquid Permeation Rate (Y)

The method for measuring a liquid permeation rate (Y) used herein was identical to the method described in the specification as filed, except for the underlined parts in the following description of page 53, line 21 to page 54, line 4 of the specification as filed, the underlined parts indicating added/changed contents.

"0.32g of a sample to be measured, which has been cut out by scissors so as to have this weight preliminarily, is immersed in 50 ml of physiological saline for one hour so as to prepare a fibrous hydrogel.

On the other hand, a filter (mesh opening: 10 μ m to 15 μ m)-enclosed-type chromatograph tube (diameter (internal diameter): 25.4 mm, and length: 35 cm) equipped with a cock (internal diameter: 5 mm, length: 10 cm) and a capacity scale is fixed vertically (in gravity direction) with the cock being closed and the cock side facing downward.

Then, the above-mentioned fibrous hydrogel together with a physiological saline are placed on a bottom of the chromatograph tube by using tweezers, and physiological saline is poured from the upper part of the chromatograph tube; a pressure shaft (weight: 15.5 g, and length: 31.5 cm) equipped with a round mesh (diameter: 25 mm) with 150 μ m openings (JIS Z8801-1:2000) perpendicularly at one of ends of the shaft is placed in a way in which the mesh side is a fibrous hydrogel side; and furthermore a weight (91.5

g) is placed thereon, and the hydrogel and physiological saline are left to stand for one minute."

1-2-4. Method for Measuring Absorption Time (Z)

The method for measuring an absorption time (Z) used herein was identical to the method described in the specification as filed, except for the underlined parts in the following description of page 54, lines 25 to 26 of the specification as filed, the underlined parts indicating added/changed contents.

"1.0 g of a sample, which has been cut out by scissors so as to have a weight of 1.0 g preliminarily, is put in a 100 ml measuring cylinder, and 100 ml of physiological saline is charged further at once."

1-3. Absorbent Article Measuring Method

Disposable diapers were produced by the method according to the present specification, and were subjected to measurement. However, since the absorbent article of the cited reference 1 was in the form such that absorbent resin particles adhere to a base material of fibers, and in this form, it was impossible to weigh a required amount of each sample, and it was impossible to place each sample uniformly. Accordingly, operations were added/changed, as indicated by the underlined parts.

1-3-1. Production of Disposable Diapers

Disposable diapers were produced by the same method as that according to Example 21 described in the specification as filed except for added/changed parts shown below by underlining.

"100 parts of an absorbent article, which has been prepared according to the example of the cited reference 1 and cut out by scissors so as to be 100 parts preliminarily, was placed on a piled part as uniformly as possible. Thereafter, 100 parts of fluff pulp was weighed, and the absorbent resin particles and the fluff pulp were piled evenly so as to have a basis weight of about 400 g/m² in total, and pressed with the pressure of 5 Kg/cm² for 30 seconds to obtain an absorber of Example 21. The obtained absorber was cut into a rectangular shape of 14 cm × 36 cm, and on the upper surface and the lower surface of the absorber having the rectangular shape, sheets of water absorbing paper (basis weight: 15.5 g/m²) having the same size as that of the absorber were placed, respectively. Furthermore, a polyethylene sheet used in

a commercially available disposable diaper was placed on a rear side and a polyethylene non-woven fabric (basis weight: 20.0 g/m²) was placed on a front side, whereby a disposable diaper was produced.”

1-3-2. Measurement of Disposable Diapers

Each of the disposable diapers thus prepared was subjected to measurement of an absorption amount until leakage, surface dry feeling, and a SDME surface dryness value by the methods described in the specification of the present application, and the results are shown in Table 2.

2. Regarding Absorbent Articles of Cited Reference 4 (Kanack et al.: US 5,002,814)

Each of absorbent articles of Examples 1 to 3 of the cited reference 4 was subjected to measurement of a diffusion absorption amount, an absorption time (Z), a liquid permeation rate (Y), and a water-retention amount (X) in the manner described in the specification as filed, and the results are shown in Table 1. Disposable diapers in which the absorbent articles of Examples 1 to 3 of the cited reference 4 were used were produced by the same method as that of Example 21 of the present invention, and each of the disposable diapers was subjected to measurement of an absorption amount until leakage, surface dry feeling, and a SDME surface dryness value, and the results are shown in Table 2.

3. Analysis of Results

As clear from Table 1, none of the results of the above-described comparative test examples satisfied the requirement of the diffusion absorption amount as described in claims 7 and 13 of the present application.

Further, none of the results of the above-described comparative test examples satisfied the requirement of the absorption time (Z) as described in claim 8 of the present application.

Still further, none of the results of the above-described comparative test examples satisfied the requirement of the water-retention amount (X) of claims 9 and 10 of the present application.

Regarding the disposable diapers produced with the foregoing absorbent articles of the cited references, all the same exhibited significantly inferior results regarding the absorption amount until leakage, the surface dry feeling, and the SDME surface dryness value, as compared with the disposable

diapers of Examples of the present invention, as shown in Table 2.

Table 1

	Comp. Test Ex.	Diffusion absorption amount	Absorption time (Z)	Liquid permeation rate (Y)	Water- retention amount (X)
①Nakamishi et al (US 4721647)	1(A)	7	Not reaching 70%	195	18
	1(B)	5	Not reaching 70%	183	21
	1(C)	4	Not reaching 70%	215	23
	2(A)	6	Not reaching 70%	186	16
	2(B)	5	Not reaching 70%	210	21
	2(C)	2	Not reaching 70%	235	24
	3(A)	7	Not reaching 70%	183	19
	3(B)	6	Not reaching 70%	220	20
	3(C)	3	Not reaching 70%	226	21
	4(A)	8	Not reaching 70%	175	18
	4(B)	5	Not reaching 70%	228	20
	4(C)	3	Not reaching 70%	231	21
	5-1	4	Not reaching 70%	191	17
	5-2	3	Not reaching 70%	215	19
	5-3	5	Not reaching 70%	223	20
	5-4	4	Not reaching 70%	204	23
	5-5	3	Not reaching 70%	198	19
	5-6	5	Not reaching 70%	191	17
	5-7	3	Not reaching 70%	181	23
	5-8	4	Not reaching 70%	210	20
	5-9	4	Not reaching 70%	234	24
	5-10	3	Not reaching 70%	226	26
	5-11	2	Not reaching 70%	209	20
	5-12	3	Not reaching 70%	213	15
	5-13	5	Not reaching 70%	204	14
	5-14	2	Not reaching 70%	209	16
	5-15	4	Not reaching 70%	222	25
	5-16	3	Not reaching 70%	231	23
	5-17	2	Not reaching 70%	216	22
	5-18	3	Not reaching 70%	211	16
②Knack et al (US 5002814)	1	18	3.4	15	28
	2	26	3.8	14	27
	3	24	2.9	16	29

Table 2

	Comp. Test Ex.	Absorption amount until leakage (g)	Surface dry feeling	SDME surface dryness value (%)
①Nakamishi et al (US 4721647)	1(A)	187	×	18
	1(B)	174	×	15
	1(C)	171	×	12
	2(A)	192	×	15
	2(B)	183	×	16
	2(C)	175	×	14
	3(A)	162	×	17
	3(B)	174	×	15
	3(C)	131	×	13
	4(A)	164	×	19
	4(B)	124	×	17
	4(C)	135	×	15
	5-1	145	×	19
	5-2	152	×	15
	5-3	139	×	12
	5-4	145	×	17
	5-5	139	×	15
	5-6	168	×	13
	5-7	171	×	19
	5-8	146	×	14
	5-9	151	×	12
	5-10	135	×	17
	5-11	145	×	18
	5-12	139	×	16
	5-13	127	×	15
	5-14	161	×	14
	5-15	165	×	13
	5-16	173	×	14
	5-17	165	×	13
	5-18	145	×	11
②Knack et al (US 5002814)	1	290	Δ	30
	2	280	Δ	32
	3	260	Δ	26

Note: Δ: Dry feeling at a satisfactory level with slight wetting

×: Wettish state with poor dry feeling or wet state without dry feeling

I declare under the penalty of perjury of the laws of the United States of America that the foregoing is true and correct to the best of my information and belief.

Signed this July 11, 2008, at Kyoto, JAPAN


Daisuke TAGAWA